

REMARKS

The present amendment is in response to the Office Action dated October 15, 2004, where the Examiner rejected claims 1-19. Claims 1-19 were rejected on 35 USC 102 grounds and 35 USC 103 grounds. Additionally, the Detailed Action identified informalities to the Specification.

By the present amendment, the comments in the Specification and the Claim Objections in the Detailed Action are addressed.

A. Specification

The Examiner identified the title of the invention to be non-descriptive in the Detailed Action on page 2, line 7-8 of the Specification Section. It is respectfully submitted that the current title is indicative of the invention because the invention is directly related to preserving or “minimizing” the loss of barrier materials during the photoresist stripping or “removal” process. The Applicant is not sure if the Examiner is commenting on the title not being adequately memorialized in the claims, or if the title is too broad and does not provide sufficient information for indexing and searching as described in MPEP 606.01.

To more clearly reflect that the title is supported by the claims, the Applicant has included this language in the independent claims 1, 9 and 15. Thus the Applicant contends that the amended claims clearly indicate the “invention to which the claims are directed.” See Office Action, Page 2 in Specification section.

However, the Examiner has also commented that the title of invention is “not descriptive.” The Applicant interprets this statement to mean that the title is too broad.

The Examiner will notice that the *amended* independent claims 1, 9, and 15 have been amended to reflect that prior to removing the photoresist layer with carbon monoxide (CO), the dielectric layer is etched. Thus, if the Examiner contends that the title remains too broad, the Applicant proposes changing the title to read “MINIMIZING THE LOSS OF BARRIER MATERIALS DURING PHOTORESIST STRIPPING WITH AN ETCHED DIELECTRIC LAYER.”

Therefore, the Applicant respectfully requests instruction as to how the Examiner would like to proceed in titling the invention.

B. Claim Rejections – 35 USC § 102

The Examiner has rejected all claims under 35 USC 102(e) as being anticipated by Chooi et al. (Chooi), U.S. Patent 6,465,888 hereinafter referred to as “Chooi ‘888.” In light of the currently amended claims, the Applicant respectfully disagrees with this conclusion.

As the Federal Circuit stated in *W.L. Gore & Associates v. Garlock, Inc.* “anticipation requires the disclosure in single prior art reference of each element of the claim under consideration.” W.L. Gore & Associates V. Garlock, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Amended independent claims 1, 9 and 15 reflect the addition of a substantive limitation which provides: firstly, etching the dielectric layer and exposing said barrier layer; and secondly, feeding a gas mixture that comprises carbon monoxide (CO) for photoresist removal. Support for the etching of the dielectric is provided throughout the specification including *inter alia* the flowchart in FIG. 2 at blocks 204 and 214 and Page 12, line 1-15.

Applicant has reviewed the description of Chooi '888, which begins col 6: line 52 through col. 10: line 53. In particular, Chooi '888 teaches, first, etching the optional organic BARC, the dielectric layer, and optional stop-etch layer with etching chemistry that includes fluorocarbon gases and carbon monoxide gas. See col. 7, line 59 through col. 8, line 10. Chooi '888 then teaches, secondly, removing the photoresist layer by "oxygen plasma ashing." See col. 8, line 11–12.

Chooi '888 clearly identifies a two-step process that distinguishes between the first step of etching optional organic BARC, the dielectric, and the optional stop-etch layer, and the second step being the removal of the photoresist layer. With respect to the photoresist layer, the Chooi '888 embodiment only teaches photoresist removal using an oxygen plasma.

Here, the Applicant's amended claims teach a two-step process, in which the dielectric is first etched and the barrier layer is exposed and secondly the photoresist is removed with carbon monoxide (CO). Further still, the Applicant claims the selective removal of the photoresist layer with little or no removal of the barrier layer.

As amended, Chooi '888 fails to satisfy the 35 USC 102 anticipation standard because Chooi '888 fails to teach of each element of the amended independent claims. More particularly, Chooi '888 fails to teach the use of CO to remove the photoresist when the dielectric has been previously etched, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

Thus, the Applicant respectfully submits that with respect to amended independent claims 1, 9 and 15, each of these amended claims overcomes the 35 USC 102 rejection. Since the remaining dependent claims depend on each of these

independent claims, the Applicant submits these dependent claims also overcome the 102 rejection.

In spite of not presenting an argument for each dependent claim, the Applicant reserves the right to respond to these objections at a later time. The Applicant respectfully submits that Applicant's rights are not prejudiced by failing to respond to the objections presented for each of the dependent claims identified above. Should the Examiner require a response to each of the dependent claims in view of the arguments propounded for each independent claim, Applicant respectfully requests such instruction.

C. Claim Rejections – 35 USC § 103

The Examiner has rejected claims 1 - 19 as being unpatentable over Han et al., U.S. Patent No. 6,352,921 (hereinafter “Han ‘921”) in view of Chooi et al., U.S. Patent No. 6,465,888 (hereinafter “Chooi ‘888”). In view of the currently amended claims, the Applicant respectfully disagrees with this rejection and provides arguments to overcome this rejection below.

The Examiner starts his arguments by referring to Han ‘921 and arguing that Han ‘921 teaches feeding a carbon monoxide gas for selectively removing the photoresist layer with little or no etching of the exposed barrier layer. See Page 5 of the Office Action. The Examiner’s Arguments at the bottom of Page 4 and top of Page 5 of the Office Action appear to be directed to independent claims 1, 9, and 15.

The Examiner references col. 7, lines 24 – 40 of Han ‘921 for supporting the Examiner’s position for independent claim 1. Regretfully, the Applicant does not find support in the lines identified by Examiner. Please note that this pattern of incorrect reference numbering occurs throughout the arguments supporting the 35 USC 103

rejections. To expedite the prosecution of this patent application, the Applicant assumes that support for the Examiner's argument are located at col. 6, line 49-64 in Han '921. Applicant requests further clarification if this is not the case. A hard copy of Han '921 is provided so that the Examiner is able to better understand the Applicant's position.

As stated in section 706.02(j) of the MPEP:

After indicating that the rejection is under the 35 U.S.C. 103, the examiner should set forth in the Office Action:

- (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
- (B) the difference or differences in the claim over the applied reference(s),
- (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
- (D) the explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

To expedite the prosecution of this patent application, the Applicant is assuming that the Examiner intended to refer to col. 6, line 49-64 in Han '921 for the 35 USC 103 obviousness rejection of claim 1, 9 and 15. Please note, the Applicant respectfully requests clarification, which states that this assumption is correct so that a clear written record can be created as to the basis for granting a patent.

The amended independent claims 1, 9, and 15 overcome the Examiner's rejection because the amended claims teach a two-step process, in which the dielectric is first etched, and secondly the photoresist layer is removed with a carbon monoxide (CO) gas mixture. Further still, the Applicant claims the selective removal of the photoresist layer with little or no removal of the barrier layer.

As stated in Section 2143 of the MPEP:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure. Section 2143, MPEP Rev. 2.0, May 2004, pg. 2100-129.

Han '921 and Chooi '888 fail to satisfy the 35 USC 103 obviousness standard because both patents fail to teach each element of the amended independent claims, namely the use of carbon monoxide (CO) to remove the photoresist when the dielectric has been previously etched to expose the barrier layer, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

Additionally, in Han '921 and Chooi '888 there is no motivation to combine these references to provide using carbon monoxide (CO) to remove the photoresist when the dielectric has been previously etched to the barrier layer, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

Finally, in Han '921 and Chooi '888 there is no suggestion of success in using carbon monoxide (CO) to remove the photoresist when the dielectric has been previously etched to the barrier layer.

Thus, the Applicant submits that independent claims 1, 9 and 15 are in a state of allowance.

Regarding the remaining dependent claims, the Applicant contends these dependent claims should also be found to be in a state of allowance because they depend

from independent claims 1, 9 and 15. The Applicant respectfully reserves the right to argue the merits of these dependent claims at a later time. However, in light of Applicant's confusion about the Examiner's rejections and due to the compelling arguments made for independent claim 1, 9, and 15 to overcome the obviousness rejection, the Applicant contends that the need to argue the merits of the dependent claims 1-19 can be accomplished more effectively at a later time, if it becomes necessary.

D. Conclusion

For all the foregoing reasons, allowance of claims 1-19 pending in the present application is respectfully requested.

Respectfully Submitted;

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